

Younger, R. (2017) Fire and memory: transforming place using fire at henge monuments. *Archaeological Journal*, 174(2), pp. 335-362.  
(doi: [10.1080/00665983.2017.1295752](https://doi.org/10.1080/00665983.2017.1295752))

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Deposited on: 27 September 2017

# Fire and Memory: Transforming Place using Fire at Henge Monuments

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*Henges — Late Neolithic–Early Bronze Age earthwork monuments — often have long life-histories of reuse and rebuilding over generations. At some sites, fire-lighting and the deposition of fire-altered materials played a significant role in certain phases of the use of the henge. This article reviews the evidence for fire in the life-histories of four henges in Scotland, and interprets the various ways in which fire was employed at different times and at different sites. It argues that fire had a transformational effect, not only upon monuments and materials, but also characterized and transformed people's experiences and memories of particular sites, thus creating links between monumental sites and quotidian experience during the Neolithic and Bronze Age in Scotland.*

## INTRODUCTION

Henge monuments are circular ditched earthwork enclosures built across Britain from the thirty-second to twenty-sixth centuries cal. BC. They are typically multi-phase sites, with excavations of henge monuments consistently demonstrating that these places were repeatedly reused and rebuilt over centuries. Many sites where henges were constructed during the Late Neolithic–Early Bronze Age were used in various ways before they were monumentalized. At some sites, pre-henge activity included fire-lighting and other fire-related activities, including the deposition of fire-altered materials. This article considers the roles, uses and possible significance of fire during the life histories of four henge monuments in Scotland: Cairnpapple Hill (West Lothian), Balfarg (Fife), North Mains (Perth and

Kinross) and the Stones of Stenness (Orkney) (Illus. 1) Rather than seeking to offer a comprehensive account of all the uses of fire across henge sites in Britain and Ireland, drawing on my doctoral research focusing on Scottish sites (Younger 2015), I explore four sites which allow us to reflect on one particular theme: the ways in which fire and fire-altered materials were used to transform certain places and monuments, and to transform people's experiences and memories of these sites during the Late Neolithic and Early Bronze Age.

Illus. 1 here

## BACKGROUND: HENGES MONUMENTS IN SCOTLAND

Henges can be considered part of a broader repertoire of Late Neolithic and Early Bronze Age circular ritual monuments. They are found across southern and eastern Scotland and Orkney; throughout most of England and Wales; and there are around fifty henge-like enclosures in Ireland, predominantly in the east and particularly the Boyne Valley (O'Sullivan and Downey 2012, 35). Henges form a morphologically diverse group of sites, but generally they consist of earthworks enclosing a roughly circular area; the earthworks usually comprise a broad ditch, and sometimes also an external bank, broken by one or two narrow causeways allowing access to the interior area. The interior of the henge can sometimes contain other features – these might include timber or stone circles. Henge monuments are also associated with a range of placed deposits including burials, sometimes associated with cists or cairns. When henge sites have been excavated, they are typically found to have a long biography of use and reuse, and the central features enclosed by the henge earthworks may often pre- or post-date the bank and ditch, sometimes by several centuries.

Henge construction can be dated from the thirty-second to twenty-sixth centuries cal. BC, but in parts of Scotland, such as the north-east, they continued to be constructed into the seventeenth century BC. There is also a tradition of ‘mini-henges’, smaller than 10–12 m in diameter, in north-east Scotland and Perthshire (Bradley 2011). Currently, some 116 henges and probable henge sites can be identified in Scotland. To date, about a quarter of these (twenty-six sites) have been excavated to some degree. Meanwhile a further five have been investigated through geophysical or other types of survey.

In this article, the four case studies — Cairnpapple Hill, Balfarg, North Mains, and the Stones of Stenness, Orkney — were selected for discussion because of several reasons: there is evidence for distinctive uses of fire at all of these sites; they have been excavated and published to a relatively high standard; they have been reinterpreted to some extent to take account of more recent understandings of henge monuments in Scotland (Barclay 1999, 2005; Gibson 2010a; Richards 2005, 2013); and because there is dating evidence available for at least some of the phases of use of each of these sites. Elucidating the sequence of construction and use of these henge monuments remains a difficult task, however. When excavated, henges are often found to be relatively ‘clean’ sites, with a paucity of material culture or dateable material recovered. In addition, they are usually multi-phase sites, used and reused over a long period, adding to the challenges and complexities of their dating. Excavated henge sites frequently lack clear stratigraphic relationships between features which may date from separate phases of use: features such as post-holes, pits or burials enclosed within them sometimes neither cut, nor are cut by, any other features, making it difficult to construct even a relative chronology for some henge sites. While the chronology of the sites discussed in this article might seem poor, the available dating evidence and our understanding of the sequence of construction at these sites is better than that available for many excavated

henge sites; and the fire-related practices and transformations identified provide a theme allowing us to compare and contrast the life-histories of these monuments.

## FIRE, TRANSFORMATION AND THE CREATION OF MEMORIES

Fire could be used in many ways, both at monuments and in other aspects of Late Neolithic and Early Bronze Age life. It would have been the only human-made heat source available for cooking, and would also have served as the only human-made light source (Sørensen and Bille 2008, 254). Fire can be used creatively – in the production of ceramic objects, or in cooking a meal. However, fire can also be destructive, used to burn down or consume. Central to both the constructive and destructive capabilities of fire is its ability to transform materials: from raw food, to cooked; unfired clay objects to ceramic vessels; dead bodies into cremated bone. It is argued here that it is this transformative power that made fire significant at henge sites, and that fire and fire-altered materials were used to transform locations, and to transform people's relationships with certain places (see Brophy et al. 2017).

The transformative and mnemonic properties of fire have been pointed out by Andrew Jones (2007, 61), who notes that material culture, including substances such as fire 'impinges upon and interacts with the person', evoking past experiences. Jones notes the performative aspect of using substances and materials which are sensually and socially charged (*ibid.*, 62). In the context of Neolithic Scotland, Jones suggests that fire can play a 'connective role', creating links between different social practices, for example food (cooking) and death (cremation) (*ibid.*, 114). He points out the central location of hearths in Neolithic structures such as the timber halls at Claish and Balbridie, and suggests that fire was not only transformative, but

also encouraged cohesion, as people gathered round hearths together to participate in communal activities (ibid., 109–110).

Fire could also be used to destroy however, and in Neolithic Scotland, timber structures such as timber halls, mortuary structures and timber cursus monuments were often burnt down (Jones 2007, 110; Noble 2006, 45–70; Thomas 2015, 146). Julian Thomas has discussed the cursus monuments at Holyrood and Holm (both in Dumfries and Galloway), each of which was burned more than once; at Holm, it seems there was a long sequence of burning and rebuilding (Thomas 2007, 244; 2015, 146–47). Thomas (2000, 80) argues that the deliberate burning of structures was a form of consumption and performance; this repeated destruction and rebuilding of monuments was an ongoing performance, which contributed to the place-history of a locale, and helped places to enter into the collective memory of a community (ibid., 81; Thomas 2015, 151). The dramatic performative and destructive properties of fire therefore contribute to making monuments into significant locales in the landscape.

The destruction of monuments by fire can however be a complex process. Firstly, Gordon Noble (2006, 56–57) has noted that it is difficult to burn down a substantial timber structure. Setting light to large timber posts, for example, might need a significant investment of time and resources. Furthermore, different strategies for monument destruction may be employed. At Dunragit cursus monument, some posts were burned, while others were withdrawn (Thomas 2015, 150). Similarly, at the palisaded enclosure at Forteviot (Perth and Kinross), individual posts were treated in different ways, with some being burnt down, others removed, and still more left to decay *in situ* (Noble and Brophy 2011, 78–79). Burning at monuments should therefore be viewed as the deliberate choice of one particular strategy which is

situated within a broader repertoire of treatments of materials and monuments during the Neolithic period in Scotland.

Archaeologists have long stressed the potential of an ‘elemental’ archaeology which considers the importance of different substances, elements and materials. Colin Richards (1996, 314–16) stressed the importance of considering ‘socially-constructed’ constituents of monuments such as the landscape, but also of water, earth, air and fire, which he notes are identified as elements in many different cultures. Understanding the materiality of monuments, including elements such as fire, should therefore be seen as important if we wish to understand monuments as part of broader cosmologies and world-views.

Fire — both fire-lighting, and the deposition or discarding of fire-altered materials — were prominent features in certain episodes of the lives of the sites discussed in this article. These were sites with a long life-history, which were used, reused and rebuilt repeatedly over generations. In order to make sense of this rich use-life, this article employs a biographical approach to henge monuments, situating uses of fire within the context of changing uses of the sites over time (see also Younger 2015, 68–75). Monument biography has previously been used to interpret monuments and landscapes which have a very long history of use, and in particular to consider reuses of monuments long after their initial construction (Holtorf 1998; Pollard and Reynolds 2002; Darvill 2006). It lends itself as an approach to consider the roles of fire at henge monuments because, as Gosden and Marshall (1999, 170) have noted, a biographical approach considers that an object or monument can acquire multiple meanings over time. A biographical perspective therefore also allows consideration of the changing

contexts in which fire was used, and potential different meanings and significances attributed to fire, at henge sites over a long time period.

Fire and fire-altered materials were indeed employed for various purposes, and to contrasting effects, at different sites throughout the Late Neolithic and Early Bronze Age, and fire was also used in different ways over time at each of the sites in question. Fire was involved in the initial establishment of many of these sites as significant places, whether by lighting fires in hearths (as at Cairnpapple), or strewing the site with burnt material and fired pottery (as at Balfarg). Fire, and materials made using fire, played a role in transforming these sites into meaningful locations in the landscape, even before they were monumentalized. Later, fire also played an important role in continuing to transform these sites over time, whether to clear the ground before monuments were built or rebuilt at North Mains, or as an agent of destruction when a stone setting at Balfarg was broken apart. Fire, and fire-altered materials such as pottery, burnt animal bone, and cremated human bodies, were also significant elements of the use and experience of henge sites. Cooking and feasting were important events taking place at Balfarg. Likewise, at the Stones of Stenness, where such events were centred around a huge hearth. Cairnpapple and North Mains had long histories of use as repositories of cremated remains — human bodies transformed by fire — deposited in places which had themselves been transformed by fire.

Although the uses of fire and fire-related materials at henge sites can be seen as transformative, this combined both practical and ceremonial aspects of transformation. Uses of fire ranged from the pragmatic, such as controlling vegetation growth; to more memorable and probably ritualized events such as feasting or cremation. The scales of burning events



was also variable, creating a range of experiences at different sites – from the small, intimate hearths at Cairnpapple, to a huge, monumental hearth at the Stones of Stenness; and from ‘domestic’ cooking events at Balfarg, to cremation rites and burials at North Mains. Hence, it may be unnecessary to always separate prosaic and ceremonial uses of fire, as both might equally be ritualized and have, to some extent, a transformative effect on people, objects and places.

Indeed, many archaeologists have already attempted, from various perspectives, to explore the integration of quotidian and ritualized fire-use in late Neolithic and Early Bronze Age societies. For example, Alex Gibson (2002, 50) has described the possibility that pottery manufacture may have been considered a ‘magical’ process during prehistory, since fire affects a ‘magical’ transformation on an object and an irreversible change. The irreversible aspect of the transformation is significant: cooked food cannot be made raw again; fired ceramics have completely different properties to unfired clay; and cremated bodies can never again be whole and unburnt. So too the transformations effected on a *place* by fire-lighting may have been regarded as irreversible. In the case of sites like those discussed below, the association of these sites with fire at an early stage in the life-history of the sites, may have been the event which set these sites on an irreversible trajectory towards monumentalization.

Paradoxically, while transformative fire could be regarded as magical and powerful, fire — as the only available human-made source of heat and light during prehistory (Sørensen and Bille 2008, 254) — would also have been a substance with which people in the past had daily, routine or even mundane encounters. The use of fire at ceremonial places, such as henge sites, might therefore have created links between different spheres of life; for example,

between the home and a monument or other special places in the landscape. Such links might be forged through manipulating people's sensory experience of a site, and mediating these experiences through fire; for example, creating a memorable experience at a henge site, associated with the sight, smell and sound of fire (see Brophy et al. 2017). Hearing a crackling fire or smelling smoke in a different context or location may then prompt people — perhaps even involuntarily — to recall the experience they had had at the same locale or another place where fires had been lit and used in a memorable way or location.

People's experience of monumental sites, especially during important or dramatic episodes of a monument's life such as rebuilding or demolition, or their inauguration as significant places, may have been mediated through fire, as outlined in the biographies of the four henge sites discussed below. This would ensure a dramatic sensory experience, full of redolent smells, sounds and sights associated with fire, which would be memorable not only in the context of a special place in the landscape, but could also act as powerful triggers to memory in other contexts. Fire, therefore, would not only effect visual, physical changes upon a site, but would also transform people's experiences of a site, in turn transforming them in people's imaginations and memories.

Fire could also serve to forge relationships between special places or monuments, and people's experiences of everyday life and quotidian practices such as cooking, making pottery, or even sitting around a fire sharing meals, songs and stories. Through the presence of fire in each of these spheres of life, 'liminal' or special places such as henge sites would be brought into people's everyday experience — not physically, but through memory and imagination, mediated and recalled via the sight, smell and sound of fire. Sørensen and Bille

(2008) see fire as an analogy for memory: both fire and memory, they suggest, need ‘fuel’ to sustain them. I suggest that fire at monumental sites, linked with their transformation, might create a sense of continuity and a link to the past – a substance which creates and transforms, even as it physically destroys the materials it burns.

In summarizing this article’s approach to fire and memory at henge monuments, among many of its aspects and uses, fire can be used to effect irreversible transformations, and to create a memorable sensory experience. The biographies of the four henge sites presented here show different fiery trajectories that contextualize the deployment of fire, offering a nuanced discussion of the evidence in comparative terms and with data from other sites.

## CAIRNPAPPLE

Cairnpapple Hill is situated in the Bathgate Hills in West Lothian with extensive views over the Firth of Forth to the north. It was excavated by Stuart Piggott in 1947–8 (Piggott 1948). Despite reinterpretation by Gordon Barclay (1999), the chronology of Cairnpapple remains relatively obscure; the site was excavated in a pre-radiocarbon dating era, and there are many ‘free-floating’ features at Cairnpapple which have no stratigraphic relationships to each other. Although narratives of Cairnpapple have been strengthened by the availability of new radiocarbon dates for the site (Sheridan et al. 2009, 214), current interpretations of the site are, in many regards, still based on comparisons with similar excavated monuments.

In addition to the banks and ditches of the henge monument, the site at Cairnpapple comprised at various times a stone setting (later destroyed), cairns and beaker burials (Illus 2

– 3); four early medieval inhumation graves were later added to the prehistoric monuments. However, the site was first established as a special place during the Early–Middle Neolithic, when activity at Cairnpapple Hill was characterized by fire-lighting in hearths on the summit of the small hill, and by deposition of fragments of pottery, and cremated human remains.

Illus. 2 here

### PRE-MONUMENT HEARTHES AND BURIALS

Fires were lit in six small hearths at Cairnpapple: five inside the area later enclosed by the henge (three of these were sealed under a later cairn), and one sealed beneath the henge bank (Barclay 1999, 32) (Illus. 3). No radiocarbon dates are available from any of the hearths, but Barclay (1999, 28, 39) suggests that the hearths substantially pre-dated the henge earthworks, and are amongst the earliest activity on the site, probably dating to the 4th millennium cal. BC. The position of the hearths, most of which are sealed underneath the henge earthworks and cairn, confirms the likelihood that they date relatively early in the sequence of activity at Cairnpapple. The presence of hearths implies that before the monumentalization of the site, Cairnpapple Hill was visited repeatedly – probably by small groups of people, as the hearths are not large - and that fires were lit there regularly, not only as a one-off burning event. The hearths were interpreted by Piggott (1948, 88) as ‘utilitarian’, but he gives them little attention in his report because ‘no artefacts were found with them’ (ibid.), although he notes that oak and hazel were burned on the hearths (ibid.).

Illus. 3 here

Prior to the construction of the henge and other monuments, a few objects, including pottery sherds and worked stone, were deposited or discarded on the site. This may have taken place around the same time the hearths were in use, although as already noted, no artefacts were directly associated with the hearths (Piggott 1948, 88; Barclay 1999, 32). The objects were on the old land surface underneath the cairn, suggesting they were discarded there during the earlier phases of use of Cairnpapple. The assemblage of material is small — two sherds of pottery, two fragments of axeheads, and an unrecorded number of lithics — and characterized by fragmented material. The fragments of polished stone axeheads include one from Great Langdale in the Lake District (Group VI), and one from Penmaenmawr, North Wales (Group VII) (Piggott 1948, 79–80). Both are from the cutting edge of the axes, and one of the fragments has been retouched. The pottery sherds are body sherds of Plain Bowl Pottery; Barclay (1999, 28) suggests that both the axeheads and pottery sherds date to the fourth millennium cal. BC. The fragmented objects were deposited on the old land surface, within the area which would later be enclosed by the henge, and were sealed beneath the later cairn (Piggott 1948, 79) (Illus. 3).

Piggott (1948) suggested that the axes may have been broken while being used to clear the site of trees prior to monument-building; there is no way to know whether or not this was the case. It is not clear whether the axes were brought to Cairnpapple as whole objects, or were already fragmented by the time they reached the site. If the pieces of axe were deposited accidentally, then they may well have been broken or dropped while being used on the site, as Piggott (1948) suggested. Therefore, it is possible that the broken fragments of axe found at Cairnpapple were used to cut down trees and vegetation which were then burned in the hearths. Whether or not the axes were used on Cairnpapple Hill prior to their deposition

there, perhaps there is a symbolic link between the deposition of fragments of objects used to cut wood — perhaps including firewood — at a site with hearths.

Sometime after the use of Cairnpapple Hill as a venue for fire-lighting and deposition during the Early Neolithic — but still prior to the monumentalization of the site — Cairnpapple was also the location of a series of cremation burials. These were associated with pits, or possibly post-holes. Accompanying two of the cremation deposits were bone or antler pins; one of these has been dated to 3341–3024 cal. BC (SUERC-25561) at  $2\sigma$  (Sheridan et al. 2009, 214); this remains the only radiocarbon date available for Cairnpapple. Although the hearths and deposition activity on Cairnpapple Hill are not well-dated, it is likely that they may have been broadly contemporary with the cremation cemetery, as these activities probably also predate the monumentalization of the site, being sealed underneath later structures including the cairns; it is probable therefore that the site was used for fire-lighting, cremation and that materials were discarded there, during the Early–Middle Neolithic. It is possible too that the use of Cairnpapple as a cremation cemetery continued over a long period, as Barclay (1999) has suggested based on variations in the style of each cremated deposit. The use of a site as a cremation cemetery before the construction of a henge centuries later is paralleled at other excavated henge sites – notably Stonehenge, where the cremation cemetery dating to the 3rd millennium BC is the largest known cremation cemetery in the British Isles (Parker Pearson 2012, 193; Willis et al. 2016) – but also, relatively more locally to Cairnpapple, at Henge 1 at Forteviot, Perth and Kinross, where cremation deposits were associated with the stump of a snapped standing stone buried in its socket, and further cremation deposits may also have been associated with a decommissioned stone setting (Noble and Brophy 2015, 167).

## LATER ACTIVITIES

After Cairnpapple had been marked as a special place in the landscape through fire-lighting, the burial of cremated remains and the discard of pottery, the site continued in use and was monumentalized and rebuilt. This began with the marking or enclosure of the site with a setting, possibly of timber uprights (Barclay 1999, 25), but more recently thought to be a stone circle (see Gibson 2010a, 70–71), as Piggott (1948, 70, 76) had originally believed. Based on analogy with other excavated henges, this may have been built several centuries after the earliest uses of the site. The stone setting appears to have been destroyed during later remodelling of the site, probably during the construction of burial cairns during the Early Bronze Age; Piggott (1948) suggested that the stones may have been reused in the construction of the cairn.

After Cairnpapple had been marked by a stone setting, it was enclosed by henge earthworks. The henge enclosed an area 44.2 m by 38.1 m within a rock-cut ditch 3.66 m wide, and between 0.91 m and 1.22 m deep (Piggott 1948, 82). The ditch and external bank were broken by two entrance causeways, on the north and south; when Piggott excavated the site, the bank survived to a height of *c.* 0.61–1.22 metres (*ibid.*). This enclosure and monumentalization of the site probably took place after the cremation cemetery was no longer used, and after the construction of the timber/stone setting. Based on comparison with similar henge sites such as North Mains and Forteviot 1, both in Perth and Kinross, the henge at Cairnpapple was probably constructed during the twenty-fifth to twenty-third centuries BC (Younger 2015, 175). The lower fill of the ditch, a clayey-silt, suggests that it may have been allowed to begin to fill-in naturally fairly soon after the henge had been constructed (Piggott 1948, 83).

Subsequently the use of Cairnpapple as a burial place, and its association with fire-altered materials, resumed. Burials took place probably during sporadic episodes, and perhaps over several centuries, during the Early Bronze Age. These included two Beaker burials, one of which was monumentalized, and incorporated a stone setting and large monolith within the area demarcated by the henge ditch (Barclay 1999, 39). Barclay (*ibid.*) suggests that these burials were covered by a cairn; after which, two cists were constructed beside the monumentalized burial, and also covered with a cairn (*ibid.*, 39, 41). This cairn may have incorporated some of the stones from the putative stone circle into its construction as kerb stones (Piggott 1948). Finally, a large cairn was built overlying the earlier cairns; Barclay (1999, 41) suggests it may have enlarged the earlier monuments. The final cairn partly overlies the in-filled henge ditch, and two urn burials were also inserted into the surface of the cairn (Barclay 1999, 41).

## BALFARG

The henge at Balfarg, Fife, was identified as a henge in 1947 following aerial survey of the site; the site had been farmed since at least the late eighteenth century, and although the henge had almost been ploughed flat by the mid-twentieth century, the site had still been marked by two extant standing stones (Mercer 1981, 63–4). Balfarg henge was surveyed by Atkinson in 1950 (1950, 58), and excavated by Roger Mercer (1981, 64) from 1977–8 in advance of the expansion of the New Town of Glenrothes and the construction of a housing estate on the site of the henge. Like Cairnpapple, the sequence of construction of the various features at Balfarg is not well-understood, as noted by Alex Gibson (2010a, 65), due to plough truncation, a lack of dateable material, and the scarcity of stratigraphic relationships



between features; these are common problems in understanding the chronology of many henge sites. Balfarg henge is part of a larger complex of monuments, including another hengiform monument at Balfarg Riding School; Balbirnie stone circle; ring cairns; and an extensive pit complex. Gibson (2010a) has reinterpreted Balfarg henge after new radiocarbon dates became available for Balbirnie stone circle. The henge site at Balfarg was used for deposition and burning, and subsequently for the construction of a series of concentric timber settings, henge earthworks, a stone circle (later destroyed), and Beaker burial (Illus 4 and 5). The site is located on a knoll of glacial till, within a shallow flat basin in the landscape, with hills on the north-eastern horizon and East Lomond Hill 7 km away to the north-west (Mercer 1981, 65–66).

Illus. 4 here

#### BURNING

As at Cairnpapple, the activity which first marked Balfarg as a special place was characterized by burning and the deposition or discard of pottery – described by Gibson (2010a, 71) as ‘Grooved Ware-associated pyro-ritual activity’, probably dating to the end of the third millennium BC (ibid.). The burning and deposition activity are represented by a discrete deposit in the north-western portion of the area later enclosed by the henge (Illus. 5); within this deposit were sherds of Grooved Ware pottery from at least sixteen different vessels, some represented by multiple sherds (Mercer 1981, 84). Some of the sherds were scorched with ‘burnt deposits’ on the interior surface (Mercer 1981, 162; Noble 2006, 145), suggesting that the vessels may have been used for cooking. Fourteen of these vessels were also represented by sherds found in the sockets of a later timber setting at the site, suggesting that material from this deposit was used to back-fill the post-holes during later monument construction at Balfarg (Mercer 1981, 96; Gibson 2010a, 71–72).

## Illus. 5

In addition to the deposit of burnt material and pottery sherds, Grooved Ware sherds were also deposited in a pit at Balfarg. This pit was located on the south of the site, within the area later enclosed by the timber circles (Mercer 1981, 81). The pit also contained what Mercer (1981, 81) described as ‘a mass of burnt material’, including cremated bone. There were also fragments from five other pottery vessels (*ibid.*, 97), and evidence of *in situ* burning (Mercer 1981, 97; Gibson 2010a, 67). Given the evidence of *in situ* burning in this pit, it is possible that it may have been used as a cooking pit or for firing pottery (Younger 2015, 202–3).

Neolithic pottery was most likely fired in an open bonfire or pit, with a short firing time, therefore rarely affecting the ground under the fire or the sides of the pit (Gibson and Woods 1997, 49). Excavation of an experimental pottery firing pit by Alex Gibson has shown how scant the impact of burning can be on the sides of a pit, even when temperatures of up to 800 °C are reached (Gibson 2002, 45); although the deposits of charcoal and burnt material in the base of the experimental pit seems reminiscent of the ‘mass’ of burnt material which Mercer (1981, 81) found in the Balfarg fire pit. Alternatively, given that the cremated bone found in the fire pit at Balfarg may have been animal bone (Gibson 2010a), the pit may have been used for cooking; or indeed could have had more than one purpose in a combination of these different uses.

The earliest place-making activity at Balfarg, as at Cairnpapple, was characterized by burning and the discard of material on the ground surface. Burnt material, and pottery sherds, created by firing vessels, were deposited at the site. A fire was set in a pit at the site, and possibly used for either pottery-firing or cooking food – both activities involving a transformation

effected by fire. Some of the pottery fragments deposited at the site during this early use were later disturbed or moved, and ended up in the backfill of post-holes during the construction of a timber setting on the site – an inclusion which may have been accidental, or a deliberate way of incorporating fragments of earlier material into the timber structure. It is unclear whether fire-setting and pottery deposition at Balfarg took place in a one-off, short-lived event, or was a gradual accumulation of artefacts and a set of practices over a longer period; but if the pottery spread relates to cooking or a feast, as seems likely, then it is probably the debris from a one-off event.

## LATER ACTIVITIES

Later activities at Balfarg, as at Cairnpapple, were characterized by the monumentalization of the site, which was demarcated and enclosed by a series of different monuments. A timber setting or settings were constructed; based on radiocarbon dates from two of the postholes, Gibson (2010a, 72) suggests that the timber settings were constructed after the twenty-ninth to twenty-fifth centuries cal. BC. It is possible there were several concentric timber settings at Balfarg, based on the quantity of small postholes across the interior of the later henge (Mercer 1981, 108). The innermost setting, made of posts probably averaging 0.4–0.6 m in diameter, is about 25 m in diameter, and concentric to the henge ditch on the north and east arcs (Mercer 1981, 80). In a continuation or revival of the earlier fire-lighting on the site, it is possible that fires were lit on or near the site at Balfarg during construction of the timber setting(s); alder, hazel, oak, and willow charcoal was found in the backfill of the postholes, along with Late Neolithic pottery sherds, lithics and fragments of burnt bone (Mercer 1981, 152). The burnt bone was probably animal bone according to Gibson (2010a, 68).

The site was further monumentalized with the construction of a stone setting or circle, which Gibson (2010a, 72) dates to the 'second quarter and almost certainly by the middle of the third millennium BC'. The stone setting was later destroyed, and all but two of the stones were removed from the site (Gibson 2010a, 69). The destruction of the stone setting may have taken place when the henge was constructed, or even, Gibson (*ibid.*, 69–70) suggests, much later, when the site was ploughed and used for farming. It is equally plausible however that the stone setting was destroyed much earlier, possibly during the Early Bronze Age. There are several other examples of stone settings at henge sites being destroyed in prehistory, for example at Cairnpapple as discussed above; at Moncreiffe Hill, Perth and Kinross, where a stone setting was destroyed during remodelling of the site during the Bronze Age (Stewart 1985); and further afield at Dyffryn Lane, Powys, where the stone setting was partially ruined (either deliberately or accidentally) with at least one stone of the setting having been toppled before the twenty-fifth to twenty-third centuries cal. BC (Gibson 2010b, 229). In the case of Balfarg, the henge ditch passes so close to the stone holes on its north-eastern arc that it seems unfeasible that the stones could still have been in position when the henge ditch was dug. Also, given that the site may have been covered over by a mound after it was used for burial (Gibson 2010a, 71–72) sometime in the twenty-second to nineteenth centuries cal. BC (Sheridan 2007), it is likely that the stone setting had already been destroyed by this time. There was evidence of burning in the base of two of the stone sockets, leading Mercer (1981, 163) to suggest that burning was used to effect the destruction and removal of the stone setting. Possibly fires were set to fracture the stones into small pieces to facilitate their removal from the site – a pragmatic use of fire to transform the site.

Finally, the site at Balfarg was enclosed by a henge, with a substantial ditch 2.5 m deep (Mercer 1981, 66), possibly dug around 'the end of the second half of the third millennium'

(Gibson 2010a, 72). Perhaps around the same time the henge was constructed, Balfarg was also used for burial; a young adult, possibly male (Mercer 1981, 164) was buried in the centre of the henge, accompanied by a handled Beaker and flint knife. The burial has been radiocarbon dated to 2124–1881 cal. BC (OxA-13215) at 95.4 % probability (Sheridan 2007). The site may then finally have been sealed over by a mound (Gibson 2010a, 71–72). It is possible that pieces of the fire-shattered standing stones could have been incorporated into the mound. At Forteviot, it was possible that part of the henge interior was covered with a cairn, which may have included pieces from a destroyed stone setting (Brophy and Noble 2012). At Balfarg, however, any traces of the putative mound have been erased, perhaps by later ploughing on the site.

## NORTH MAINS

The henge site at North Mains, Perth and Kinross, was excavated by Gordon Barclay from 1978-9 (Barclay 1983, 123). As with the other henge sites discussed in this article, and as is the case with many excavated henge sites, understanding the chronology of the site is difficult, as most of the dates obtained were for internal features such as post-holes. As with Balfarg and Cairnpapple, there are no stratigraphic relationships between the majority of the features. Some additional radiocarbon dates became available decades after the excavation of the site, as part of the National Museums of Scotland cremated bone dating programme (Barclay 2005, 86; Sheridan 2003).

North Mains is situated on a flat area between two rivers, the Earn and the Machany Water. The site was used for pit-digging and burial from the late third millennium BC, and was

enclosed by timber settings and a henge monument (Illus. 6), before being used for cremation and burial. As for Cairnpapple, the monument was also reused as a burial site during the first millennium AD (Barclay 1983).

**Illus. 6 here**

The earliest archaeologically visible use of the site at North Mains was for cultivation, or possibly the use of the site to graze livestock, which caused disturbance and gleying (waterlogging and concentration of iron in the soil resulting in a distinctive blue-grey colour) in the fossil topsoil (Barclay 1983, 180). Based on dates for later uses of the site, it is probable that this took place during the third millennium BC. Three pits were also dug on the site, one in the area which would later be enclosed by the henge, and the other two later sealed beneath the henge bank (Illus. 7). The site was also marked by a timber setting, just to the south of two of the pits; charcoal found in the post-pipes and packing in the post-holes gave a range of dates from 3350–2200 cal. BC (Barclay 2005, 91 table 8.2), suggesting that the timber setting was built around the start of the third millennium cal. BC. The timber setting encloses a smaller, elliptical setting of postholes or pits; no dateable material was recovered from the inner setting so it remains unclear whether it pre- or post-dates, or is contemporary with, the larger timber setting (Barclay 1983, 150).

**Illus. 7 here**

## BURIAL, BURNING AND CREMATION

Cremated remains were buried at the site, to the south-west of the timber setting. Like some of the pits, this cremation burial was also sealed under the henge bank (Barclay 1983, 125, 180). The burial has been dated to 2200–1910 cal. BC (GrA-24007) (Barclay 2005, 86; Sheridan 2003). This provides a *terminus post quem* for the construction of the henge earthworks, which must have been constructed around the twenty-second to twentieth centuries cal. BC, perhaps soon after the cremated remains were buried on the site. The henge followed the slightly elliptical shape of the timber settings.

During the early second millennium BC, there was also an episode of burning at North Mains; the posts of the timber setting were rotting when this took place (Barclay 1983, 126), as charcoal was found in the tops of the post-holes. This suggests that burning could have been used as a way of preparing the site or clearing the ground before the construction of the henge earthworks.

North Mains continued in use after the construction of the henge, and during the early–mid second millennium BC, was used for burial, including Beaker and Food Vessel burials (Barclay 1983, 126). The burials were placed inside the area enclosed by the henge, inserted into the henge bank, or on top of the decaying timbers of the earlier setting, making reference to the earlier traces of monuments on the site (Illus. 8). Indeed the timber setting(s) may have been visible only as depressions in the ground by the time the burials were placed at North Mains (Gibson 2005, 75). Material, including burnt bone, charcoal and pottery, was placed in the top of some of these hollows; Barclay (1983, 133–4) described this as ‘domestic or ritual

debris'. It is notable that this included burnt material. Finally, in the late second millennium BC, an area to the north of the henge was used as a pyre and burial site (Barclay 1983, 126).

Illus. 8 here

## THE STONES OF STENNESS

The Stones of Stenness, Orkney was excavated by Graham Ritchie in 1973–4 (Ritchie 1976). The site is located on a promontory between the Loch of Harray on the north, and the Loch of Stenness on the south-west (Ritchie 1976, 1); it is inscribed as part of the UNESCO Heart of Neolithic Orkney World Heritage Site, along with the settlement site at Skara Brae, the passage grave Maes Howe, and a second henge and stone circle: the Ring of Brodgar. The Stones of Stenness was reinterpreted by Colin Richards (2005) following his excavation of the nearby Neolithic settlement site of Barnhouse. Stenness has been often-discussed in henge literature, being potentially the earliest dated henge site in the British Isles (e.g. Wainwright 1989; Harding 2003); yet, despite this, our understanding of the full construction sequence at the site remains scant. Most of the available radiocarbon dates relating to the henge are from the earliest fills of the ditch. The interior of the henge has never been completely excavated (Ritchie 1976, 18; see Illus. 9 for a plan showing the extent of Ritchie's excavation); and so it remains difficult to give a definitive account of the construction sequence of all the features of the site.

Illus. 9 here



## HEARTHS AND FEASTING

Features inside the henge at the Stones of Stenness included a large square hearth close to the centre of the site, and possibly also a second square hearth (Illus. 10). The central hearth measures 2.1 m by 1.9 m, and is associated with a layer containing fragments of charcoal and burnt pieces of bone, probably animal bone (Ritchie 1976, 12), as well as a burnt material locally called ‘cramp’, indicating that seaweed was burned in the hearth (Ritchie 1976, 12–13, 48). Twenty-four sherds and fragments of pottery, including both body sherds and rim sherds of Grooved Ware, were associated with the central hearth feature (Ritchie 1976, 23–4). Charcoal from the central hearth has been dated to 2910–2578 cal. BC (SRR-351) at 95.4% probability (calibrated using OxCal 4.2). To the north of this large hearth is another, smaller square feature, possibly a ‘dismantled hearth’ forming a monumental entrance to the site (Richards 2005, 222), or even the remnants of a structure with a hearth at the threshold, according to Richards’ (2013, 74) most recent interpretation. A piece of decomposed wood from this hearth structure has been dated to 2872–1459 cal. BC (SRR-592) at 95.4% probability (calibrated using OxCal 4.2) (Ritchie 1976, 14), so it is possible that this structure or hearth may have been broadly contemporary with the central hearth.

**Illus. 10 here**

The area surrounding the hearth may already have been monumentalized by the time the hearth was in use. A stone setting surrounded the central area where the hearth was located; the setting consisted of eleven or twelve stones forming a circle 30 m in diameter (Ritchie

1976, 9). It has been suggested that the stones may have been erected 'sequentially' over time, with individual stones being added piecemeal, rather than as a single project (Richards 2005, 217–18, 224). A henge was also built on the site, enclosing the stone circle and central area. The henge ditch was 44 m in diameter, and 4 m wide; the ditch was about 2.3 m deep, cut into bedrock (Ritchie 1976, 10; Richards 2005, 218). The construction of the henge can be dated to the thirtieth to twenty-sixth centuries cal. BC, based on radiocarbon dates obtained from animal bones from the bottom fill of the ditch. The dates give a combined range of 3350–2600 cal. BC ( $2\sigma$ ), so it is possible that the henge ditch had already been dug before the central hearth was in use, and that the use of the hearth was broadly contemporary with the construction and use of the earthworks (Barclay 2005, 91). Species represented include cattle, and also wolf or dog; Ritchie (1976, 10) noted that the assemblage consisted mostly of mandibles or the ends of limbs, which may indicate food use. The food was either prepared on site, or may have been prepared elsewhere then brought to Stenness for consumption (Richards 2005, 223). Sherds of Grooved Ware pottery from at least four different vessels were found in the henge ditch terminals (Ritchie 1976, 11). Drawing on the large hearth, animal bones and pottery, Richards (2005, 224) interprets the Stones of Stenness as the site of 'lavish' feasting, lit by huge fires in the central hearth. Possibly the bones found in the ditch represent some of the debris from such a feast.

The hearths were subsequently reconstructed, so it is unclear exactly how long they remained in use. The alteration to the central hearth may have been an act of decommissioning, with the addition of four large stone slabs to the hearth. It is possible that these stones may have been brought to Stenness from the settlement at Barnhouse, located approximately 150 m to the north-east of the henge site (Richards 2005, 221). Richards (*ibid.*) suggests that the hearthstones may have held symbolic significance linked with gathering and meetings

between communities. The ‘lithicization’ or monumentalization of the hearth seemed to mark the end of its use (Richards 2005, 225). Later, the henge ditch may have been allowed to become waterlogged (Richards 1996); interest in the Stones of Stenness continued, with several pits dug in the central area sometime in the third to tenth centuries AD (Ritchie 1976), but the stone setting was gradually allowed to fall into ruin until only two stones remained upright by the nineteenth century (Ritchie 1976, 1).

## DISCUSSION: FIRE, TRANSFORMATION AND THE CREATION OF MEMORIES AT HENGE SITES

At each of the four henge sites discussed, fire was used in various ways at different times to transform sites, and to create particular sensory experiences and memorable associations. At Cairnpapple, fires were set in hearths, and fire-altered materials including pottery and cremated human remains were deposited on the site, before it was monumentalized by a stone circle, henge and cairns. At Balfarg, burnt material and pottery were strewn on the site, and a fire lit in a pit, possibly for cooking; later, fire may have played an important role in transforming Balfarg, when the stone setting was dismantled. North Mains was used for cremation burial, before the construction of timber settings and a henge on the site; the ground was cleared by burning before the henge was built, and the site then continued to be used for cremation and burial. Use of the Stones of Stenness focused on a large central square hearth, probably used for feasting inside the monument.

Often, these fire-related activities occurred early in the use-life of the site, such as the pre-henge burial at North Mains, or the hearths and cremation cemetery at Cairnpapple; and so fire could be said to play a role in helping to establish these sites as meaningful locations

which would later be monumentalized. In other instances, the use of fire may have been more pragmatic, such as its use for cooking at Balfarg or Stenness, or to clear the way for later monument-building at North Mains; even these more mundane, everyday uses of fire could arguably still transform the site, and transform people's experiences of these places.

Fire was used to transform sites and experiences in a range of ways and at a range of scales at henge sites. At Balfarg and the Stones of Stenness, fire was used during cooking or feasting events at the sites. At the Stones of Stenness, the fire was the focus of food consumption (Richards 2013, 78), and perhaps also central to the monument itself. The size of the hearth at Stenness and its central location within the henge suggests perhaps a greater degree of theatricality and a feasting event on a larger scale; this may have been a contrast to Balfarg, where food was cooked in a pit, suggesting perhaps a less visually dramatic, smaller-scale event. There is evidence that the large henge-enclosure at Durrington Walls, Wiltshire, may have been used for feasting (Parker Pearson 2012, 102; 118–21), possibly on a seasonal basis (*ibid.*, 126). Eating — whether feasting, or sharing a meal with a few others — was not a neutral activity for Neolithic communities, as Whittle (2003, 30) has pointed out in relation to numerous ethnographic studies. Participation in public, communal feasts or meals would have been memorable, socially significant events, and fire may have been associated with such events. At Stenness, the huge hearth may have meant that fire was a memorable aspect of feasting events; while at Balfarg, fire may have been employed merely pragmatically for the preparation of food. At Balfarg, the food preparation and feasting took place before the site was monumentalized (Noble 2006, 204; Mercer 1981, 114). Possibly this was a pre-requisite of monument construction, or it may have been one of the reasons why this site later continued to be used and monumentalized.

As well as being the only human-made heat source available for cooking during prehistory, fire would also have served as the only artificial light source (Sørensen and Bille 2008, 254). The presence of hearths at Cairnpapple and the Stones of Stenness suggests the possibility that these sites were used at night, with visits and activities taking place during hours of darkness. This would alter people's experience of place, presenting an alternative range of sensory experiences and creating very different experiences from that of a daytime visitor to the site. Night-time visitors would have been reliant on a different set of senses, perceiving the site predominantly through their senses of hearing, touch and smell more than sight.

Visibility would be restricted to only small, discrete areas; the pools of light in the vicinity of the hearths. Richard Bradley (2005, 112) has described how in addition to heightening other senses, lighting a fire in a monument at night would therefore cut it off from the wider landscape, focusing attention and experience in one small area as everything beyond the firelight is made invisible by the darkness. The animation of shadows effected by flickering firelight could be used to choreograph a very particular experience of a site; for example serving to disorientate and confuse the visitor, playing tricks with their sense of sight and creating illusions of movement as the flames shifted. Bille and Sørensen (2007, 271) describe light as 'manipulating', able to create or transform experiences of a given space. Visiting a site at night may therefore encourage an experience of a certain location as a liminal, ambiguous place. The use of firelight to separate off a tiny field of vision would restrict the experience, cutting off the immediate surroundings from the outside world. In comparison to encountering a site by daylight, visiting a site at night might be an isolating experience, the restricted vision created by darkness and pools of firelight dictating an individual experience

in which you can hear and feel others, but cannot see their faces, creating an intense, focused and potentially frightening experience.

As already discussed, fire can be used creatively, for example, as part of the production process for certain objects and materials. So also in the case of henge monuments, fire is used to create – whether in the establishment of a special place in the landscape, as at Balfarg; or in orchestrating a particular experience of that place, as could have been done using the hearths at Cairnpapple and the Stones of Stenness. However, fire also has the potential to be destructive. Fire may have been used destructively at Balfarg, where fire was involved not only during the construction of the timber settings, but was used to effect the destruction of the stone setting. Breaking up stones by fire-setting may well have served a pragmatic purpose — fragmenting monoliths into more manageable pieces of stone to be more easily removed from the site — but could also have been a stage-managed event. Fires would need to be carefully tended and managed, and the sight and sounds of stones cracking apart would no doubt be spectacular. The potential trauma of watching a long-standing monument being comprehensively destroyed would also have a profound impact on observers. Fire could thus be associated with dramatic, transformative events in the life of the site. Similarly, at North Mains, the site may have been burned to clear it before the henge was constructed, resulting in charcoal making its way into the top of the postholes. Such events could be memorable, dramatic and even theatrical. Gordon Noble (2006, 57–58, 70) has suggested that spectacles associated with burning — for example, burning down a monument — may have been so dramatic that they would become fixed in people’s memories, a phenomenon known as ‘flashbulb memories’. Perhaps the uses of fire at some henge sites included the careful stage management of burning events in order to fix such dramatic events in people’s minds. Such uses of fire might also be costly in terms of time and resources; gathering sufficient fuel, and

tending a fire long enough and to sufficiently high temperatures, in order to destroy a monument, might be a protracted and memorable task in itself.

At other henge sites, fire was used to effect changes, or to maintain or create a particular visual aesthetic, but could be interpreted in a more pragmatic way. It could be argued that the use of fire to clear the site at North Mains, while transformative, was done for prosaic reasons, as the easiest way to clear vegetation before the construction of a monument. At the Ring of Brodgar, Orkney, there is evidence that fires were set in the ditch to burn vegetation (Downes et al. 2013, 110), preventing the henge earthworks from becoming overgrown. This may have been something that was done seasonally, at a particular time of year – a part of the calendar of activities for a prehistoric community, with fire being used as an integral part of the rhythms of life. In being used to burn vegetation from the ditch, the use of fire at the Ring of Brodgar was both destructive and creative – fire was used to destroy plants and vegetation, but was also used to create or maintain a particular aesthetic for the monument. Setting fires in the ditches would also be a striking sight, with smoke and flame perhaps visible from some distance away; but it seems likely that such uses of fire, although transformative, would be considered prosaic.

In other instances, the association of henge sites with fire is subtler and less direct, and is evident through the deposition of fire-altered material such as cremation deposits on the site, rather than through episodes of *in situ* burning. Bodies for example may be cremated elsewhere, and the burnt remains then carefully collected and brought to a special site for deposition. This may have been the case at Cairnpapple, as there is no indication that the cremated remains deposited during the early life of the site were burnt on the hill; although,

as outlined above, the site was substantially altered by later monument construction and rebuilding, and so it is feasible that such evidence has been lost. At Forteviot Henge 1, Perth and Kinross, although there is no evidence of pyres on the site of the later henge, analysis of the deposits from the pre-henge cremation cemetery has suggested that the collection of the bones from pyres was ‘meticulous’ (Leach 2012, 41). This suggests that the decision to deposit the burnt remains at Forteviot was a very deliberate choice. The choice to deposit cremated remains and fragments of other objects can be seen as a way of creating links between people and places; the decision to effect this through the medium of fire-altered materials such as cremated remains and fire-altered materials can be seen as a carefully considered choice. It may also have been a choice that had a significant impact on future uses of the site. Noble and Brophy (2015) have suggested that establishing the cremation cemetery at Forteviot may have been the event which subsequently inspired the construction of a monument complex in the same location. At North Mains, the burial of cremated human remains both began the use of the site before it was monumentalized, and was one of the final acts at the site after the henge had been constructed there. The link with fire was more direct at North Mains than at Cairnpapple, as at least some of the remains buried at North Mains may have been cremated on site, on pyres just to the north of the henge bank (Barclay 1983, 187, 275).

Fire was used to create a range of different and contrasting experiences at different henge sites, including events on vastly different scales at different sites. The small hearths and cremation cemetery at Cairnpapple, suggest that the site was initially used on a small scale, for intimate gatherings which perhaps only a select group had access to and controlled. This is in contrast to the evidence for sites such as the Stones of Stenness, where the hearth in the centre of the site is large enough to admit a much larger group of participants. There is also a



stark difference in the timbre of events between different henge sites — fire was involved in a range of activities, from feasting and cooking, to cremation and grieving — and would invoke a range of emotions and experiences. Some of these might have been lively, such as the feasting event at Balfarg which resulted in detritus being left strewn across the ground surface; other events might be more emotionally turbulent, such as the lighting of cremation pyres at North Mains. There is also a contrast between the early uses of some of the sites — such as the low-key burning and burial events at Cairnpapple — and the trajectories these places would later follow, which culminated in large-scale monument-building projects.

Fire would not always necessarily have been the most prominent aspect of a person's experience when they visited a henge site; experiences might vary across time, and from one individual to the next, but emotions of grief, trepidation, or excitement during events such as cremations, burials or feasts might have been uppermost. However, fire was nonetheless an important element of these experiences, and the crackling sound of fire in the background, or the pervasive scent of smoke lingering in clothes and hair, would make fire an important sensory aspect of such experiences, and one which would later serve to trigger memories of the event. While it may be memorable however, fire is also transient and temporary. This creates an interesting juxtaposition between the use of fire at henge sites — which might be small-scale and short-lived — and the subsequent monumentalization of henge sites on a larger scale, and in materials such as earth, stone and timber which are more enduring features in the landscape. Sites initially marked out by their use of fire and by the deposition of burnt materials must have continued to be visited and must have held a place in people's memories, continuing their transformation as they became storied places. The irreversible transformations effected by fire, even on a small scale, must have been important to those who witnessed or participated in these events.

## CONCLUSION

The contrasting uses of fire at Cairnpapple Hill, Balfarg, North Mains and the Stones of Stenness during the Neolithic and Early Bronze Age marked important turning points in the lives of these places. Having been chosen as locations where hearths were lit, fire-pits dug and fire-altered materials deposited, the character of these places was completely and irreversibly changed by monumentalization. Transformed into significant places, in part following and through fire deployment, each of these sites was to be increasingly monumentalized over the following centuries. Fire was part of people's experiences of such sites, their perceptions and memories of these places stage-managed and mediated through the sensory experiences and cultural associations of fire. When objects created using fire were deposited at Balfarg and Cairnpapple, fires kindled in hearths at the Stones of Stenness, meals cooked and feasts shared at Balfarg and Stenness, or cremated remains laid to rest at Cairnpapple and North Mains, these places were marked as special locations and set on trajectories towards monumentalization and ongoing use for gatherings and ceremonies. Not only were they transformed materially, through the physical alterations effected by fire, but people's perceptions of, and relationships with, these places altered too, as they remembered dramatic events, or even just intimate gatherings of a few people around a hearth in a special place. The association of fire, the everyday source of heat and light, served to sear these sites into people's memories and consciousness, linking these special and later monumental locations with quotidian experiences of fire.

While the importance of fire and burning in our understanding of timber monuments in Neolithic and Early Bronze Age monuments is well established (Noble 2006), the

significance of fire at megalithic and earthwork monuments has been less intensively explored (although see Jones 2007). Where fire is considered in literature in relation to monuments, it is often in the context of discussion about destruction (e.g. Thomas 2015, 146–57). The uses of fire at henge monuments suggest however that fire is not always used in a destructive manner, and can also be an agent for the creation and transformation of monumental sites. While fire could be used to burn and destroy timber monuments, its use at henge sites shows that it was also significant at other types of monuments during the Neolithic and Bronze Age, including earthwork monuments – albeit sometimes in a more ephemeral way than its use to burn down timber monuments.

In considering the properties of fire, we should not only remember its ability to act upon places and upon materials, but also its ability to act upon people – not only in the sense of acting as a mnemonic, but also to physically impact upon people. Andrew Jones (2007, 62) has noted the mnemonic quality of fire, which in some contexts may be due to its impression upon human bodies and ability to inflict pain. The use of fire at monumental sites might be traumatic – potentially physically; but also psychologically, in its ability to irreversibly transform monuments which might be long-standing and familiar or cherished places in the landscape.

Finally, Noble and Brophy (2011, 80) have noted the extent to which it has become ‘routine’ in studies of Neolithic and Bronze Age monuments to consider the landscape setting of sites. They note the potential of also considering elements such as trees and waterways (*ibid.*). Considering the use of elements such as fire as an integrated part of the life-history of

monuments such as henges should be seen as critical if we want to make sense of how people understood and experienced these monuments in the past.

## ACKNOWLEDGEMENTS

Some of the research in this article was first carried out during completion of my PhD thesis at the University of Glasgow; many thanks to my supervisor Kenneth Brophy for support and discussion during the research, and also for providing some of the information on Forteviot Henge 1. Thanks also to Roger Mercer and Gordon Barclay for their kind permission to reproduce published plans of Balfarg and North Mains. I am grateful to the Society of Antiquaries of Scotland for permission to reproduce Illus 2, 4, 6 and 9.

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Illus. 1 Map showing the location of the four case study sites. Contains OS data © Crown copyright (and database right) (2014)

Illus. 2 Plan of the cairn and part of the henge interior, from Piggott's excavation of Cairnpapple. I am grateful to the Society of Antiquaries of Scotland for permission to reproduce the plan (from Piggott 1948, fig. 5, facing page 82)

Illus. 3 Plan of Cairnpapple Hill henge site, showing the location of hearths (red), depositions of pottery and axes (red crosses) and postholes associated with cremation deposits (orange), in relation to later features at the site (the henge earthworks, stone circle and cairns, shaded in grey) (Redrawn after Barclay 1999, figs 7, 16, 19 and 24)

Illus. 4 Plan of Balfarg henge from Mercer's 1977-8 excavations (after Mercer et al. 1988, 66, illus. 3).

Illus. 5 Plan of Balfarg henge site, showing the area of deposition (red stippled area) and the fire pit (red) in relation to later features including the timber settings (blue), stone setting (orange) beaker burial and henge ditch (grey) (Redrawn after Mercer 1981, fig. 40)

Illus. 6 Plan of North Mains henge site from Barclay's excavations, showing the henge earthworks in relation to the timber settings and burials. I am grateful to the Society of Antiquaries of Scotland for permission to reproduce the plan from Barclay 1983, fig. 3

Illus. 7 Plan showing pre-henge pits (red) and burial (red cross) and timber settings (blue) at North Mains (henge earthworks and later features shown in grey; redrawn after Barclay 2005, 87, fig. 8.8)

Illus. 8 Second millennium BC burials at North Mains (orange) and pyre burials (red) to the north of the henge (grey). (Redrawn after Barclay 2005, 87, fig. 8.8)

Illus. 9 Plan of the Stones of Stenness, showing the extent of Ritchie's 1973-4 excavation. I am grateful to the Society of Antiquaries of Scotland for permission to reproduce the plan from Ritchie 1976, 8, fig. 2

Illus. 10 Plan of the hearth(s) (red) at the Stones of Stenness, in relation to the henge ditch and stone setting (grey); the stones added to the large central hearth are highlighted in blue. (Redrawn after Ritchie 1976, 8, fig. 2)